

STATE OF CALIFORNIA
STATE WATER RESOURCES CONTROL BOARD

In the Matter of the Petition of)
FMC Corporation for Review of)
Order No. 74-138 (NPDES Permit)
No. CA 0005151) of the California)
Regional Water Quality Control)
Board, San Francisco Bay Region.)

Order No. WQ 75-27

BY THE BOARD:

On November 27, 1974, FMC Corporation (petitioner) petitioned the State Water Resources Control Board (State Board) for review of Order No. 74-138 (NPDES Permit No. CA 0005151) of the California Regional Water Quality Control Board, San Francisco Bay Region (Regional Board). Order No. 74-138 was adopted on November 1, 1974, and prescribed waste discharge requirements for petitioner's plant located at Newark, California.

On February 21, 1975, the State Board held a hearing for the purpose of receiving evidence relative to the appropriateness and propriety of adoption of Order No. 74-138 by the Regional Board.

I. BACKGROUND

Petitioner operates a phosphate manufacturing plant located at Newark, California. The Newark plant manufactures a variety of phosphate products from phosphorus, soda ash, caustic soda, and caustic potash. The principal products produced are phosphoric acid and sodium tripolyphosphate. Approximately

25 percent of the plant production is comprised of a number of other phosphate products, including sodium orthophosphate, tetrasodium pyrophosphate, and tetrapotassium pyrophosphate. In addition, two proprietary, nonphosphate catalysts are produced at this plant.

Petitioner currently discharges an average of 1.21 million gallons per day (MGD) of industrial waste containing phosphate waste from minor leaks and spills, stormwater runoff from the plant area, boiler blowdown, cooling water, and softener regeneration wastes. These wastes are collected, combined, and piped to a spray cooling pond. Overflow from the pond is discharged to a drainage ditch, from which it flows 4,000 feet to Plummer Creek, two miles upstream from its confluence with San Francisco Bay. This area is within the proposed San Francisco Bay National Wildlife Refuge.

Pursuant to Section 402 of the Federal Water Pollution Control Act Amendments of 1972 (the Federal Act), and Chapter 5.5 of the Porter-Cologne Water Quality Control Act (Water Code Sections 13370-13389), the Regional Board, as previously indicated, adopted Order No. 74-138 on November 1, 1974, establishing waste discharge requirements for the FMC Newark plant. These discharge requirements were based on a Corps of Engineer Discharge Permit Application submitted by FMC dated June 29, 1971, an on-site plant inspection, and federal effluent limitations guidelines for the phosphate manufacturing point source category (40 CFR 422). The principal terms of Order No. 74-138 to be met by June 30, 1977, are as follows:

"B. Discharge Prohibitions

1. The discharge of all process wastes is prohibited. The discharge shall be limited to noncontact cooling water and boiler blowdown.
2. The discharge of drainage, including stormwater runoff, from process or material transfer areas of the plant is prohibited except during a 24-hour rainfall event having a recurrence period of greater than ten years. When such an event occurs, each wastewater impoundment may discharge that volume of wastewater equivalent to the volume of precipitation that falls within the area tributary to that impoundment in excess of that attributable to the ten-year, 24-hour rainfall event.

"C. Effluent Limitations

1. The discharge of an effluent containing constituents in excess of the following limits is prohibited:

<u>Constituent</u>	<u>Units</u>	<u>30-day Average</u>	<u>Maximum Daily</u>
Settleable Matter	ml/l-hr	0.2	1.0
Total Phosphorous (as P)	lbs/day kg/day	50 23	128 58
Total Suspended Matter	lbs/day kg/day	101 46	193 88

2. The discharge shall not have pH of less than 6.5 nor greater than 8.5."

Previously, the petitioner had been subject to discharge requirements adopted November 25, 1969, in Resolution No. 69-63 and Cease and Desist Orders Nos. 72-53 and 72-94 adopted August 10 and October 26, 1972, respectively. Order No. 74-138 continues these prior orders in full force until April 15, 1977.

II. CONTENTIONS AND FINDINGS

The petitioner has raised a number of issues related to the terms of Order No. 74-138. These contentions and our findings relative thereto are as follows:

1. Contention: The action of the Regional Board in prohibiting the discharge of wastes other than noncontact cooling water and boiler blowdown was improper. Petitioner contends that Prohibition B.1 of the permit should have permitted the discharge of softener regeneration waste.

Findings: Our review of the record indicates that the omission of softener regeneration waste in the list of allowable discharges was an oversight on the part of the Regional Board staff. We concur with the petitioner that there is no sound reason to preclude the discharge of this waste. However, monitoring requirements should be imposed to establish that there are no unusual or unexpected constituents of this waste that would be deleterious to aquatic life, subsequent to its inclusion as a permissible waste in the discharge.

2. Contention: Prohibition B.2 prohibits the discharge of drainage, including stormwater runoff, from process or material transfer areas except during a 24-hour rainfall event having a recurrence period of greater than ten years, i.e., a once-in-ten-year rainfall event. Petitioner contends that the maximum 24-hour rainfall involved should be specified at 2.44 inches, which petitioner contends was the maximum 24-hour rainfall recorded at the Oakland Airport for the ten-year calendar period of 1964-1973. Petitioner alleges that the Oakland Airport is the location closest to its Newark plant which maintains complete records for the period involved.

Findings: The criterion suggested by the petitioner is not consistent with accepted engineering practice for design for storm drainage facilities. As rainfall is subject to the laws of probability, an examination of the last ten years of data to determine an appropriate maximum for a once-in-ten-year is an unreliable method of predicting a ten-year storm. Petitioner's definition of the ten-year event is unacceptable. Predictive rainfall amounts developed for the Newark area by the National Weather Service provide a more realistic and appropriate standard for a once-in-ten-year storm.

3. Contentions: Petitioner contends that the "Effluent Guidelines and Standards, Phosphate Manufacturing Point Source Category" (40 CFR Part 422) which have been promulgated by the Environmental Protection Agency (EPA) do not and should not have been applied to its Newark plant. The petitioner's contentions relative to alleged non-application of the aforementioned Guidelines are based on two somewhat distinct approaches, each of which will be considered separately:

(a) Application of Guidelines: It is the position of petitioner that the Guidelines, by their own terms, apply only to the production of seven specific phosphate products. Petitioner's Newark plant makes only two of the seven phosphate products specified in the Guidelines. At the same time, the Newark plant produces eleven other products not specified by the Guidelines.^{1/}

1. By quantity of production, the record reflects that 75 percent of the Newark plant production involves products mentioned in the Guidelines.

Findings: The Guidelines involved specify that there shall be no discharge of "process waste water" from the point source category covered by the Guidelines. From a review of the Guidelines and their development, it is obvious that the Guidelines do apply and should apply in a practical sense to the petitioner's Newark plant. All of the products produced by the Newark plant, including the eleven products which petitioner contends are not specifically covered by the Guidelines, are water consumptive and do not produce "process waste water" as a part of the production process.

(b) Process Waste Waters: "Process waste water" has been defined in 40 CFR 401 as any water that "...comes into direct contact with or results from the production or use of any raw material, intermediate product, finished product, byproduct, or waste product". This definition is quite general and, if taken literally, would preclude any discharge of phosphate constituents resulting from minor leaks and spills.

Petitioner contends that the Regional Board applied a too restrictive interpretation of the concept of "process waste water" and an interpretation which is not consistent with the current EPA approach to effluent limitations involving this term. In effect, petitioner argues that it was not intended by EPA that the term "process waste waters" include waste streams coming from such sources as noncontact cooling water, separate sanitary wastes, boiler blowdown,

minor leaks and spills, and other "water which has had only incidental contact with raw materials, intermediate products, finished products, by-products or waste products."^{2/}

Findings: While we concur generally with the contention of petitioner that it was not the intent of EPA that the Guidelines exclude all discharge of phosphate waste, including that contained in incidental contact water, we do not agree that the Regional Board misconstrued the actual intent of the Guidelines or of the correct interpretation of "process waste waters". Order No. 74-138 does allow for some discharge of phosphate wastes. The Regional Board correctly construed the Guidelines by prohibiting the

2. Petitioner cites a number of authorities for this contention, primarily an excerpt from Hooker Chemicals and Plastics Corporation, et al. v. Train, etc., No. 74-1687, Brief for Respondent (EPA) involving a suit in the United States Court of Appeals for the Second Circuit. EPA indicated in its brief, at pages 51-52 that "EPA's regulations define the term 'process waste water' to mean any water which comes into direct contact with or results from the production or use of raw material, etc.... This definition can be read to include leaks and spills, non-contact cooling water slightly contaminated, and rainwater runoff. It was not the Agency's intention to intend to apply an overly broad regulation...." See also Allied Chemical Corp. v. Train, sub nom., E. I. Du Pont de Nemours & Co., Brief for Respondent (EPA), at pages 97, 104-105, and 118; and Notice of Proposed Rulemaking by EPA (40 CFR Part 415) contained in the Federal Register, Volume 40, No. 34, page 7106, concerning the Inorganic Chemicals Manufacturing Point Source Category, which recites in part:

"The Agency's intention in developing this definition [the definition of 'process waste water'] was to ensure that the regulations do apply to all wastewaters generated during the manufacturing process while at the same time excluding waste streams such as noncontact cooling water, separate sanitary wastes, boiler blowdown, effluent from water supply treatment systems, etc. In some cases, these nonprocess streams will be subject to effluent limitations which the Agency is presently developing. In any event, all such streams will be regulated in the individual permit proceedings...."

discharge of "process waste water" as that term should be correctly applied while at the same time prescribing effluent limitations for incidental contact waters to insure control of pollutants from these sources. The petitioner's real complaint in this connection does not arise from a misconstruction of Guidelines by the Regional Board but rather from a position that the actual phosphate limits established by the Regional Board are unreasonable.

4. Contention: Petitioner contends that the effluent limits for phosphorus contained in Order No. 74-138 exceed those limitations which would represent "best practicable control technology" for this industrial category. The petitioner contended at the hearing that a 30-day average of 175 lbs/day phosphate (P) and a daily maximum of 438 lbs/day phosphate (P) represented the maximum phosphate levels which are practicably achievable. In the expert opinion of the petitioner's witnesses, it was impossible to provide for collection, ultimate retention, or recycle of the entire nonprocess flow.

Findings: Upon questioning by the hearing officer and State Board staff, the petitioner agreed to reevaluate its analysis and provide an explanation of its control program and the achievable phosphorus effluent levels that would result from implementation of such a program. On May 6, 1975, the petitioner submitted a supplemental analysis.

The program outlined by petitioner consists of reduction of inplant water usage, segregation and recycle of

contaminated non-process effluent streams, containment and recycle of the initial 90,000 gallons of any rainfall runoff, and improved housekeeping in exposed plant areas.

The petitioner projected the effluent phosphate emission rate resulting from the proposed program. These projections were developed by calculating the average daily discharge over the period from April 1974 to March 1975. According to the submitted information, the average daily discharge would be 209 lbs/day. The petitioner next identified the sources of phosphate loss and performed a material balance between the identified sources and the final discharge point. It was found that 49 percent of the phosphorus was contributed by the Brick-Lined Sump. This sump collects drainage from the phosphorus unloading area, acid furnace area, acid processing area, area east of make-up and north of the rotary dryer, and blowdown from Cooling Tower No. 3. Thirty-four percent of the loss was contributed by the SHMP Sump that collects drainage from the sodium hexametaphosphate process area and dryer. Four percent was contributed by the wetted-wall heat exchangers and 13 percent by unknown sources. The mass contribution of each source was calculated based on the average loss figure. A judgment was then made as to how much reduction could be expected in each source with planned plant improvements to arrive at a proposed 30-day average of 104 lbs/day. The daily maximum was derived by calculating the relationship between the average monthly loss and average maximum daily loss for the

April 1974 to March 1975 time period. This relationship was then applied to the predicted 30-day average to obtain a 340 lbs/day figure.

The estimated contributions from each source, after reduction by further plant improvements, are as follows:

	<u>30-day average concentration Phosphate as P (lb/day)</u>
Brick-Lined Sump	31
SHMP Sump	43
Wetted-Wall Heat Exchangers	3
Miscellaneous and Unknown	<u>27</u>
TOTAL	104

The staff of the Regional Board proposed phosphate limits of a 30-day average of 50 lbs/day and a daily maximum of 128 lbs/day predicted upon full retention of the volume of runoff created by the ten-year, 24-hour storm and complete retention and recycle of all nonprocess wastewater with the exception of blowdown waters. At this time, there is insufficient substantiating evidence in the record to indicate such complete retention and recycle is practicable.

The data necessary to make a conclusive finding regarding the achievability of essentially complete retention and recycle of nonprocess wastewater, or treatment of such prior to discharge, is not available at the present time to either the petitioner or the Regional Board. It is our opinion

that such retention and recycle or treatment of nonprocess wastewaters may be both practical and within the economic achievability of the petitioner. However, in order to make informed judgments in the future regarding appropriate control technologies which should be applied to petitioner's Newark plant, it is essential that these additional alternatives be explored in detail.

The subject of appropriate phosphorus interim limits was discussed as a part of the State Board hearing. While this was not a specific issue raised by the petitioner, certain information was brought to light as a result of the hearing and as a result of the supplemental analysis provided by petitioner which we must consider to appropriately dispose of the matter before us.^{3/}

The evidence before us, primarily that submitted by the petitioner for 1974-75, indicates that the current maximum monthly average discharge for phosphate for the Newark plant for wet weather was 210 lbs/day and for dry weather was 208 lbs/day. For the same time period the average daily maximum of phosphate for wet weather was 752 lbs/day and for dry weather was 616 lbs/day. National Weather Service precipitation data for the Newark area was examined for the 1974-75 time period. A correlation analysis was performed between monthly average phosphate

3. The State Board is, of course, empowered in its review of this matter to take appropriate action itself or to require that the Regional Board take appropriate action relative to interim phosphorus limits. (Water Code Section 1332Q)

discharge (in lbs/day) and total monthly precipitation. No significant correlation is apparent.

There appears to us no basis for a differentiation between wet and dry weather for phosphate effluent limitations. However, the Regional Board interim limits contained in Order No. 74-138 are as follows:

	<u>Total Phosphorous (as P)</u>	
	<u>30-day Average</u>	<u>Daily Maximum</u>
For October thru March	980 lb/day 445 kg/day	1400 lb/day 636 kg/day
For April thru September	510 lb/day 232 kg/day	775 lb/day 352 kg/day

The Regional Board action, with regard to interim phosphorus limits, is found to be improper inasmuch as the interim phosphate limits are over twice that level produced by current control technology in use at the plant. Unfortunately, the Regional Board did not have the most current data on hand on which to base interim limits. Therefore, the Regional Board limits are so high as to discourage careful operation and maintenance at the plant. As we have previously pointed out, it is not good practice to permit discharge of pollutants in excess of levels which have historically been met by dischargers.^{4/}

4. See State Board Order No. WQ 75-12.

The interim phosphate limits should be lowered to more closely approximate the operational capabilities of the Newark plant as follows:

Total Phosphorus (as P)

<u>30-day Average</u>	<u>Daily Maximum</u>
225 lb/day	770 lb/day
102 kg/day	350 kg/day

5. Contention: Petitioner contends that settleable matter effluent limitations should be raised to a daily maximum of 2.0 ml/l-hr.

Findings: The tentative requirements on settleable matter initially proposed for inclusion in Order No. 74-138 would have established a daily maximum effluent limit of 0.5 ml/l-hr. Upon final consideration this was raised to the 1.0 ml/l-hr which presently constitutes the settleable matter limitation of Order No. 74-138. Petitioner admits that in the last year only four grab samples have violated the 1.0 ml/l-hr limitations, and we find that this limitations is appropriate and within the reasonable capability of petitioner.

6. Contention: Petitioner requests a pH limitation range of 6.0-9.5 in Order No. 74-138, rather than the present range of 6.5-8.5.

Findings: As previously indicated, the receiving water, Plummer Creek, is within the proposed San Francisco Bay National Wildlife Refuge. Petitioner's discharge contributes a significant proportion of the flow during low tide. The pH

limitation of Order No. 74-138 has been applied to similar discharges in the same area and is required by the water quality control plan for the San Francisco Bay Region. Petitioner's request is even outside the range of 6.0-9.0 that EPA has included in other phosphate manufacturing permits with which petitioner compared itself in arguing the question of applicability of the Guidelines. The pH limitation of Order No. 74-138 is appropriate.

7. Contention: Petitioner has objected to a number of items in the monitoring program established by Order No. 74-138 on the ground that they are either unnecessary or burdensome.

Findings: By virtue of the disposition being made in connection with this petition, and because petitioner is still in discussion with the Regional Board over monitoring issues, it would serve no useful purpose to explore these contentions of the petitioner at the present time. Petitioner should pursue its monitoring concerns with the Regional Board staff and the Regional Board itself if it deems such action appropriate and necessary when Order No. 74-138 is reconsidered by the Regional Board.

8. Contention: The interim effluent limits of Order No. 74-138 are effective until April 15, 1977, while the final effluent limits go into effect on June 30, 1977. (See Order No. 74-138, Interim Effluent Limitation A.1 and Provision E.3.)

Findings: Petitioner is correct. A clerical error is involved. Order No. 74-138, as presently drawn, would leave the discharge of petitioner unregulated for two and one-half months.

The transcript of the Regional Board hearing indicates that a last minute change was made in the compliance date for all sections except A and D. The originally proposed date of April 15, 1977, was changed to June 30, 1977, in the compliance schedule, but the remaining April dates were not correspondingly modified. The error involved should be corrected as should a typographical error noted in Provision E.5. Order No. 72-53 referred to in this Provision was adopted in 1972 rather than 1973 as presently indicated.

III. CONCLUSIONS

After review of the entire record and for the reasons heretofore expressed, we have concluded that the action of the Regional Board in adopting Order No. 74-138 was inappropriate and improper in part, and that Order No. 74-138 should be modified as follows:

1. Softener regeneration waste should be included in the list of allowable discharges in Order No. 74-138 subject to appropriate monitoring requirements and any necessary effluent limitations.

2. Interim phosphorus limits in Order No. 74-138 should be lowered to one year-round figure of:

	<u>30-day Average</u>	<u>Daily Maximum</u>
Total Phosphorus (as P)	225 lb/day 102 kg/day	770 lb/day 350 kg/day

3. Order No. 74-138 should be amended to require submission by the petitioner of a full and complete technical report relative to those actions or plant improvements which can be taken by the petitioner to minimize final pollutant discharge. The technical report shall be in content and detail satisfactory to the Regional Board, but should include at least the following:

(a) A contour map of the Newark plant site.

The process and transfer area should be identified, including all known and suspected sources of phosphate contaminations such as sumps, piping, etc.

(b) The retention and treatment facilities, including type and land requirements, that would need to be added to the plant to meet a 30-day average discharge limits of 50 lbs/day. In addition, an estimate should be made of that lower limit achievable through the use of the best available technology economically achievable. The amount of recycle and reuse should be detailed, including the criteria for makeup water. If it is impossible to recycle all stormwater runoff, even if it is completely segregated from cooling water and boiler blowdown, a prediction of this flow rate of this nonrecyclable waste should be made. The feasibility of installation of evaporation ponds should be studied, including the size of ponds which would be necessary and the availability of land for construction of such ponds.

The monitoring program to determine waste sources specified in the "Supplemental Submission" of petitioner of May 5, 1975, should be continued to identify the remaining 13 percent contribution from unknown sources and trace their origin. Contributions from the Brick-Lined and SHMP Sump should be evaluated to determine if they can be totally eliminated. End of pipe treatment such as lime precipitation of phosphorus should also be considered and its feasibility determined, including the required land and estimated costs. Projections should be made regarding the resultant effluent phosphate levels from each alternative.

(c) A cost analysis of pollution control facilities. The cost of present pollution control devices, in the form of an itemized list, should be compared to the total replacement cost of the plant. Both capital and operating cost should be considered. Also the cost of all additional retention, evaporation, and treatment facilities examined for their feasibility should be compared to the same base costs of plant replacement. Again, this should be in the form of an itemized list considering capital and operating cost.

(d) An interim progress report should be submitted by January 15, 1977. The final report should be due 180 days before Order No. 74-138 expires and should be filed with the Report of Waste Discharge to renew the permit.

4. Order No. 74-138 should be amended to establish final effluent total phosphorus limits of a 30-day average of 104 lbs/day with a daily maximum of 350 lbs/day.

5. The termination date of April 15, 1977, in Limitation A.1 and Provision E.5 should be changed to June 30, 1977. The adoption date of Order No. 72-53 in E.5 should be changed to August 10, 1972.

IV. ORDER

IT IS HEREBY ORDERED that the California Regional Water Quality Control Board, San Francisco Bay Region, shall review and revise Order No. 74-138 consistent with the provisions of this order.

Dated: September 18, 1975

/s/ W. W. Adams
W. W. Adams, Chairman

/s/ W. Don Maughan
W. Don Maughan, Vice Chairman

/s/ Roy E. Dodson
Roy E. Dodson, Member

/s/ Jean Auer
Jean Auer, Member